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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/591,991

09/07/2006

Yasushi Noguchi

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OLIFF & BERRIDGE, PLC  
P.O. BOX 320850  
ALEXANDRIA, VA 22320-4850

EXAMINER

KEMMERLE III, RUSSELL J

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/591,991	<b>Applicant(s)</b> NOGUCHI ET AL.	
	<b>Examiner</b> RUSSELL J. KEMMERLE III	<b>Art Unit</b> 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 10-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/23/09</u> .   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### ***Information Disclosure Statement***

The information disclosure statement filed 23 July 2009 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of foreign patents listed as citation numbers 2 and 4 that are not in the English language. It has been placed in the application file, but the information referred to regarding these two references has not been considered.

#### ***Claim Rejections - 35 USC § 112***

The previous rejection of claim 9 under 35 USC §112, second paragraph is withdrawn.

#### ***Specification***

The previous objection to the specification is withdrawn.

#### ***Claim Rejections - 35 USC § 103***

Claims 1-3, 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumazawa (US Published Application 2002/0,180,119) in view of Noguchi (US published Application 2003/0,041,574).

Kumazawa discloses a method of making a ceramic honeycomb where a mixture of cordierite forming raw materials are mixed with a forming agent (pore former) and

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water (a dispersion medium). This mixture is then extruded to form a green ceramic honeycomb structure, which is dried and fired (page 2 paragraph 13).

Kumazawa discloses that the raw materials are subjected to spray drying before mixing (page 2, paragraph 13). One of ordinary skill in the art would understand that due to the nature of spray drying, the result is a particle that is almost perfectly spherical (circularity close to 1).

Kumazawa does not disclose that the pore forming agent be hollow particles.ok  
roll over

Noguchi discloses a method of making a ceramic honeycomb structure substantially similar to the process of Kumazawa (abstract). Noguchi discloses the use of expanded foam resins (such as acrylic microcapsules) as the pore forming agent, which are hollow and provide high porosity while restraining heat liberation during firing.

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to have modified the method Kumazawa by using the hollow microcapsule pore formed of Noguchi. This would have been obvious because Noguchi discloses that the use of such pore formers results in high porosity while restraining heat liberation during firing, which can lead cracks and other defects in the finished product.

Referring to claim 6, Kumazawa discloses that the cordierite forming raw materials may include talc, kaolin, calcined kaolin, alumina, aluminum hydroxide, and silica (page 2 paragraph 13). Since they are all spray dried prior to mixing, they would all contain mostly spherical particles.

Referring to claim 8, Kumazawa discloses that the particles used by 45  $\mu\text{m}$  or less (page 2, paragraph 13).

Claims 1-4, 6, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumazawa in view of Noguchi and Suzuki (US Patent 5,087,278).

Kumazawa and Noguchi are relied upon as discussed above, but do not disclose the level of circularity of the ceramic particles, or that the spheres are formed by heating the particles to between the materials melting temperature and 300°C above the melting temperature. Specifically, they do not disclose that silica spheres are formed by heating to 1730-2030°C.

Suzuki discloses a method of forming a porous ceramic article. Suzuki specifically discloses that it is preferable that the ceramic powders be spherical so as to minimize the number of contact points between particles to more easily produce a porous body (Col 3 lines 46-49). Suzuki further discloses that the particles should be as close to a perfect sphere as possible (circularity close to 1) (Col 3 lines 53-56).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to have modified the method of Kumazawa in view of Noguchi by using spherical particles as taught by Suzuki. This would have been obvious because Suzuki discloses that spherical particles more easily create a porous body with higher strength than a body made with particles of other shapes.

Referring specifically to claims 4 and 7, Suzuki discloses making silica spheres by contacting silica particles with a flame at a temperature of around 2,000-2,200°C (Col 8 lines 22-29).

Suzuki further discloses that melt-sphered silica powder having an average diameter of up to 5  $\mu\text{m}$  is effective for such applications (Cols 15-18, Table 2).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kumazawa in view of Noguchi and Suzuki in further view of Guerfi (US Published Application 2004/0,053,050).

Kumazawa, Noguchi and Suzuki are relied upon as discussed above, but do not disclose that the spherical particles are obtained by crushing the particles with a jet air current.

Guerfi discloses a known method of forming a spherical particle out of an irregularly shaped particle that involves jet air grinding (page 5 paragraph 80).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to have modified the method of Kumazawa, Noguchi and Suzuki as discussed above by using jet air grinding to obtain spherical particles as taught by Guerfi. This would have been obvious because both the melt-sphereing of Suzuki and the jet air grinding of Guerfi are both method of forming a spherical particle out of an irregularly shaped one, and one of ordinary skill in the art would expect them to operate in similar manners to obtain a similar result.

### ***Response to Arguments***

Applicant's arguments filed 24 April 2009 have been fully considered but they are not persuasive.

Applicants argue that one of ordinary skill in the art would understand negative pressure values to indicate pressure values that level below standard pressure.

This is not found to be persuasive because this does not appear to be a commonly used system for expressing pressure, and no reference is made to explain how the negative pressure value is to be interpreted.

Applicants argue that the present application focuses on the behavior in the kneading step; however, the cited references focus on the size and shape of the starting particles in the raw material. Applicants argue that therefore the technical concept of the cited references is irrelevant to the current invention.

This is not found to be persuasive because current claim 1 recites mixing and kneading a clay material made of raw material particles and a pore-forming agent, then later details the raw material particles and pore-forming agent. It therefore appears that the current invention is very clearly concerned with the size and shape of the starting materials.

Applicants argue that the spherical particles of Kumazawa can not be retained after the kneading step.

As discussed above, the circularity of the particles of the current invention appear to be concerned with that issue before the kneading step.

Applicants argue that the fused silica on Noguchi is manufactured by pulverizing silica ingot, and therefor can not be spherical.

This is not found to be persuasive because Noguchi is relied upon for the teachings regarding a pore-forming agent, not for the circularity of the silica particles used.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RUSSELL J. KEMMERLE III whose telephone number is (571)272-6509. The examiner can normally be reached on Monday through Thursday, 7:00-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Carlos Lopez/  
Primary Examiner, Art Unit 1791  
/R. J. K./  
Examiner, Art Unit 1791